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SURGEON-GENERAL CUNNINGHAM ON THE DIFFUSION OF CHOLERA.

Having noticed the chief points which demand attention in relation to the great Hurdwar gathering of 1867, the next point to be considered is the dispersion of the pilgrims, and the effect which they had in the dissemination of the disease.

The effect of the dispersion of the pilgrims in spreading the cholera.

On this question the facts have been narrated with great care; every statement of any importance has been given, for the evidence has been considered not with the object of supporting any preconceived theory on the mode of propagation of the disease, but with the sole view of endeavouring to ascertain the truth. Did the pilgrims as they returned to their homes carry cholera with them, and thereby occasion the outbreak which subsequently followed in the various districts through which they traversed, or to which they themselves belonged?

On the first part of this question there can be no difference of opinion. That cholera went with the pilgrims from Hurdwar and accompanied them to a greater or less distance in every direction from it is a fact which admits of no dispute.

That the pilgrims carried cholera is indisputable. The history of their return which has been already given illustrates the points so clearly that it is not necessary to recapitulate the facts. Suffice it to say that the pilgrims bore the disease with them to a distance varying from 50 to 300 miles in almost every point of the compass.

This fact in itself may be regarded as evidence of communicability of the disease. That the pilgrims imbibed the poison at Hurdwar in large numbers cannot be doubted, but it is not

This fact an evidence of communicability

probable that the disease should remain latent so very long as to appear among some of them only when they had reached places so far distant as the Upper Provinces of the Punjab. At Goojerat, for example, the first case was a pilgrim, who was attacked there on the 28th April. In Cashmere the first cases were pilgrims who were attacked in the second week of June. Judging from all that is yet known of the disease, it appears much more probable that these and others who were seized weeks after they had left Hurdwar *were infected by pilgrims in whose company they had travelled*, than that the germ of the disease had remained all that time undeveloped within their systems.

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The facts exhibited in this statement are conveniently shown in the annexed map, in which the relative position of the different places, the main lines of communication, and the dates on which the first well authenticated cases occurred, have all been entered. The results may thus be summarised. Excepting Goorgaon in which the history of the first case is doubtful, no cholera appeared in any of these 51 stations or districts until ample time had elapsed for the pilgrims to re-appear, or for others to enter them from infected places. There was no simultaneous outbreak of the disease over a large area. But the general evidence is not merely negative, for excepting Goorgaon, there was no cholera in any of the fifty-one places named, until the pilgrims actually had returned; and even in Goorgaon, the epidemic prevalence of the disease dates from their return. The fact is of importance even although the outbreak of cholera took place in a few districts at so late a date as to render its having any direct connection with pilgrims very improbable.

But even more remarkable is the evidence that in most instances the first cases in the district were pilgrims

The first cases nearly all pilgrims. who had been to Hurdwar. In thirty-five out of the fifty-one districts, the first persons were pilgrims, and after they had been seized the disease appeared and spread among among the residents. In this number is not includ-

ed the case of Deyrah in which the first seizure was a traveller and probably a pilgrim, nor Meerut where the first case occurring in a resident was doubtful, nor Allyghur, nor Goorgaon, nor Umballa, in which two persons, a pilgrim and a non-pilgrim, were seized the same day, nor Jhelum where the first person attacked was a boatmen at the ferry crossed by the pilgrims, nor any other place regarding which any doubt has been expressed, and yet there remain thirty-five cases out of fifty-one, in which there is the clear statement of the Medical or District Officer, and sometimes of both that the pilgrims were the first victims.

And in addition to these facts, there are the decided opinions of Decided opinions of numerous Medical and Civil Officers by whom the Medical Officers. the first were observed. Thirty-two Medical Officers many of them of great experience, who were indefatigable in

Dr. Cutliffe	...Seharumpore.
„ J. P. Walker	...Roorkey.
„ Bamster	..Deyrah.
„ Kirton	...MoLuffernuggur.
„ Gardner	...Bijnour.
„ Collison	...Moradabad.
„ Govan	...Almorah.
„ J. C. Corbyn	...Bareilly.
„ Walsh	...Budaon.
„ Harris	...Shajehanpore.
„ Moir	...Meerut.
„ Birch	...Goorgaon.
„ Taylor	...Delhi.
„ Penney	...
„ Dickson	...Rohtuck."
Mr. Minas	...Hissar.
„ Nulty	...Sirsa.
Dr. Newton	...Kurnaul.
Dr. Beatson	...Umballa.
„ Wilson Johnstone	...Loodianah.
„ Williams	...Ferozepore.
„ Verchere	...Jullundur.
Mr. Barnes	...Hoshyarpore.
Dr Oldham	...Goordaspore.
Sub-Asst. Surgeon	...Sealkote.
Boobun Mohun	} Lahore.
Mitter	
Dr. C. M. Smith	...Montgomery.
„ Kingsmill	...Mooltan.
„ DeRenzy	...MoLufferghur.
Mr. Harrison	...Jhung
„ Mitnish	} Inspector Genl. of prisons, Punjab.
Dr. Dallas	
„ D. Wright	

carrying out the arrangements for the care of the devotees, and most careful in ascertaining the facts connected with the appearance of the disease within the limits of their own charges, are decidedly of opinion that the cholera was imported by the pilgrims. In the instance of Allyghur Dr. Kilkelly has stated his opinion that while he believes much of the spread of the disease was due to importation, there was also much which could not be traced to this cause. In other districts the Medical Officers have been unable to satisfy themselves that the epidemic was due to importation, or they see no reason to believe that it was imported, but it is a very noteworthy fact that in no case

has any positive evidence been advanced to show that such a cause was improbable, much less that it was impossible

There are only two ways in which these facts can be satisfactorily disposed of. Either they must be set aside altogether as untrustworthy, or they

The evidence cannot be set aside. must be accepted as making out a very strong

case in favor of the opinion that cholera is spread by human intercourse. It is very possible that the facts may, to some extent, be incorrect, but it is quite impossible that the whole story of the returning pilgrims carrying cholera with them from Hurdwar to Rawul Pindee, with the dates of its appearance in the successive districts through which they passed can have been invented. Besides many of the circumstances came to the personal notice of the officials by whom they have been narrated. *The facts therefore cannot be set aside*, and if they be admitted as conveying even an approximation to the truth, the history is very instructive. It cannot be regarded as a mere coincidence that in thirty-five districts of Upper India, covering an area much larger than that of Great Britain, the epidemic should have gradually appeared in one place after another immediately after the return of a body of persons stricken with the disease.

If not by the pilgrims how was the disease spread? It could not have been carried by the wind in all directions at one and the

same time, nor is it probable that the force of the wind should have exactly kept pace with the speed of the pilgrims. There are, no doubt, difficulties to be explained under

If not by the pilgrims how was the disease spread? any theory which attempts to account for the facts. How, for example, did it happen that while the pilgrims proceeding upwards appear to have carried the disease among the whole community, the pilgrims travelling in the Agra and Allahabad directions did not disseminate it? To this all that can be said is, that in the present state of our knowledge the question admits of no satisfactory explanation.

But it is to be remarked that similar difficulties exist in regard to the spread of diseases the communicable nature of which is undisputed. Can it be ex-

Analogy of other diseases.

plained, for example, why small-pox prevails

in some years and not in others; why it is much more prevalent in India during April and May than in any other months of the year, and why it altogether disappears in September; why a case of any known contagious disease sometimes occurs single and alone, and at other times appears to be the signal of the outburst of an epidemic? *It is a singular fact that all epidemic diseases, of which we have any accurate knowledge, are communicable*, and however fitful and inexplicable their course may be, it may fairly be assumed that every new case is usually if not always, the progeny of a parent of a like kind, although the parentage often, and indeed generally, cannot be traced. The seed of a plant affords a not inapt analogy to what appears to be the most rational view of the germ of epidemic disease. In order to germinate and bear fruit, the seed must be good, it must fall in and be received into a suitable soil, it must be planted at the proper season and enjoy the advantages of climate and circumstances which are best adapted for its growth. Similar conditions appear to be necessary for the propagation of epidemics. With little doubt the germ of epidemic cholera appears to reside in the evacuations of a person suffering from the disease; the circumstances favorable for its developments are filth and the want of proper sanitary arrangements. What the condition of the human body which constitutes a good soil for its reception, and what the climate and other circumstances favorable to its growth, have yet to be determined.

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But whatever theoretical differences of opinion may exist as to the propagation of cholera, the facts of the great epidemic of 1867, and its spread over

Practical conclusions to be drawn.

Northern India, teach no doubtful lesson, and it is this *that human intercourse plays a very great part in the diffusion of the disease and that returning pilgrims, in particular are*

very dangerous arrivals. How is their return to be regulated, and what measure can be adopted, as far as practical, to diminish the danger? The question is one of very great difficulty. Were sanitary conditions alone to be kept in view, it could be easily answered. In my letter to the Government of India, in the Military Department, No. 312 dated the 29th May 1867, an opinion was expressed that quarantine should be established. Regarding the matter merely in a sanitary light that opinion remains unaltered, but a careful consideration of the many important points involved leads to the conclusion that any general attempt to enforce this measure is undesirable.

